DOCUMENT RESUME

ED 363 318 IR 016 437

AUTHOR Ruberg, Laurie F.; And Others
TITLE Analysis of Visual Cues for an Electronic Bulletin Board.
SPONS AGENCY Department of Energy, Washington, D.C.
PUB DATE 93
CONTRACT DE-SC06-90RL11860
NOTE 6p.; In: Art, Science & Visual Literacy: Selected Readings from the Annual Conference of the International Visual Literacy Association (24th, Pittsburgh, PA, September 30-October 4, 1992); see IR 016 399.
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Electronic Mail; *Federal Programs; Hazardous Materials; *Information Dissemination; Information Networks; *User Needs (Information); User Satisfaction (Information); Use Studies; *Visual Discrimination
IDENTIFIERS Department of Transportation; Federal Emergency Management Agency; *Visual Cues; *Visual Design; Visual Displays

ABSTRACT

This paper reports on a study examining what critical information in the Hazardous Materials Information eXchange (HMIX), a national electronic bulletin board sponsored by the U.S. Department of Transportation and the Federal Emergency Management Agency, is of value to local government officials who have a need for the information. HMIX has two features: the bulletin board feature allows users to view listings of current hazardous materials news items and information about emergency management, training, resources, technical assistance and regulations; and the message exchange feature allows communication among users. Six users out of a total universe of 100 were surveyed by telephone to determine how HMIX was being used, what design features they liked, and what changes they recommended. The results of the survey suggested that the users of a technical bulletin board have very different needs than users of a more socially-oriented service. Technical users are willing to browse for technical information but would strongly prefer organizational and navigation schemes that would allow them to access a system, quickly scan for information, and exit. Based on this response, visual cues for technical bulletin board services should be designed to allow quick identification of categories of information and to signal similarities or differences in main menu or submenu topics. (KRN)

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ED 363 318

Analysis of Visual Cues for an Electronic Bulletin Board

by
Laurie F. Ruberg
George E. Ruberg
Judith L. Schwab

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INTRODUCTION

The Hazardous Materials Information eXchange (HMIX) is a national bulletin board sponsored by the United States Department of Transportation and the Federal Emergency Management Agency. The group of professional specifically targeted in this research are local government officials who have an on-going and critical need for information regarding hazardous materials. This group includes local government professional in law enforcement, emergency management, and fire and emergency medical services.

This paper examines what information in this service is of value to local government officials. In addition, I will determine what organizational strategies can be used to make the critical information available on this bulletin board more immediately accessible to local government personnel who use (or would use) this service.

A telephone survey among those who have already accessed the Hazardous Materials Information Exchange bulletin board will provide a description of content material users of this service highly value and do not highly value. Results of this survey will be used to create new "visual cues" and other organizational tools to improve users' access to specific information contained in the information exchange service. Evaluation of alternative screen designs based on observations and interviews with local government materials professional will provide guidelines regarding on-screen information organizers find useful or not. Ultimately this paper will provide suggestions for ways to improve bulletin board presentation formats that can be applied to information services across disciplines.

BACKGROUND

As part of a project sponsored by the U.S. Department of Energy (DOE), Management Systems Laboratories (MSL) at Virginia Tech developed a computer information network to (1) provide information on DOE transportation activities to local communities and (2) support information exchange between local government network members and DOE through a computer bulletin board system (BBS) called the Hazardous Materials Information eXchange (HMIX). MSL was assigned the responsibility to develop and maintain the information to put on a specific menu item (referred to on HMIX as a topic): the DOE/UETC local government network (LGN) topic.

In September 1991, the primary

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contractor, the Urban Energy & Transportation Corporation (UETC), announced to local government network members the opening of the LGN topic on HMIX, briefly describing how to access and use HMIX. HMIX, like all computer BBSs, transmits information over phone lines to anyone who has a personal computer and a modem. The Federal Emergency Management Agency (FEMA) and the U.S. Department of Transportation (DOT) Office of Research and Special Programs Administration are the sponsors of HMIX. HMIX, designed especially for the distribution and exchange of hazardous materials information, has two primary features. The bulletin board feature allows users to view listings of current hazardous materials news items and subjects containing public access information about hazardous materials emergency management, training, resources, technical assistance, and regulations. The message exchange feature allows communication among users through electronic mail and file transfer.

A computer BBS is an effective tool for assisting DOE in providing a centralized channel of easily accessible and current hazardous materials transportation information to every local government network member who has the capability to access HMIX. Local government network members and DOE also have the opportunity to use the computer BBS for exchanging information through messages or downloadable files with one person or many people.

HMIX was selected as the system for the LGN topic for several reasons including:

*Local government network members are part of HMIX's target audience, the community of hazardous materials professionals.

*HMIX provides a 24 hour, 7 days a week toll free access line.

*HMIX does not have any registration or daily usage costs.

*HMIX has 25 other topics which provide information about hazardous materials.

*HMIX seemed easy to use compared to other computer BBSs.

SYSTEM SPECIFICATIONS AND DESIGN CHANGES

The first step in the design process was to understand HMIX's specifications. Once HMIX's specifications were understood, we tried to design the best way of portraying information and setting up methods for the exchange of information among local government network members and DOE. Each specification is briefly described below followed by a description of the design solution.

Ease of viewing an individual screen

The user can only read 23 lines of text on their screen at one time. When many pieces of data are included on more than 23 lines of text, the user will have a hard time understanding the information provided by the data. Also, the user cannot refer back to data that has scrolled off the screen unless they take the time to return to the beginning of the menu and scroll back through to the data they need.

Our solution was to include all the data for a block of information in sections with fewer than 23 lines so the user will not have to start from the beginning of a subtopic and scroll back through pages of data to piece together information from different sections. In this block of information, enough data is

given so the user can decide if they are interested in the subject. For users who have a further interest in the subject, we provide brief instructions on how to obtain more information.Other refinements we made to increase readability include:

* Shortening the width of the text on the viewable screen.

* Scrolling new pieces of information to the top of the screen.

* Putting boxes around topic descriptions

* Using bold text

Ease of viewing information on more than one screen

HMIX takes approximately 5 seconds to write 23 lines of text on the users screen. When a lot of information is included on the system, users can be discouraged from using the system because of the time required to scroll through a lot of information.

Our solution was to keep the information divided into small, useful, and easily accessible sections. We divided our subtopics so the categories of information would contain the fewest pages as possible. The small categories of information allow the user to quickly access the piece of information their searching and to quickly scan through the subjects of their choice.

Ease of exchanging messages and other information

HMIX has several very effective means of exchanging information. Users can exchange information by sending electronic mail messages and by uploading and downloading computer files. Messages and files for the same individual can be stored under all 26 topics on HMIX, requiring the user to join each topic to retrieve messages and files. A lot of this information can be lost if the user doesn't know how to find the information.

Our solution was to provide simple instructions to LGN topic users explaining how to read messages, send messages, and download files. The instructions were developed based on the assumption many local government network members are inexperienced computer BBS users. We also recommended users send all messages and files under the LGN topic to help ensure local government members will be able to find information provided by other members and DOE.

Using HMIX

Without the right instruction, a beginning computer BBS user could be easily discouraged from using HMIX. FEMA and DOT provide a manual explaining how to use HMIX with a lot of advanced instructions and additional information the beginner does not need.

HMIX is easy to use for an advanced computer BBS user and the FEMA/DOT HMIX manual suits their needs. So we developed simple instructions to teach the beginning computer BBS user what they need to know to get the full use out of HMIX. We also provided a point of contact at MSL to assist LGN users with any problems they have using HMIX.

Evaluation capabilities

Users can select a menu option to leave comments to the HMIX system operators or they can leave a comment to an LGN topic coordinator through electronic mail. Although HMIX doesn't have the

ability to log responses to specific evaluation questions, the HMIX systems operator can program HMIX to report on who is using the LGN topic.

We included a submenu on the LGN topic describing how to leave a comment to the LGN topic coordinator DOE systems operator through electronic mail on HMIX. To track usage, the HMIX systems operator agreed to program HMIX to provide us with a report listing the names of users, how many times they accessed each submenu, and how many files they downloaded.

SURVEY METHODOLOGY AND SUMMARY OF RESULTS

We developed a survey instrument to ask frequent users of Topic 26 their views on the design of that topic, as well as HMIX overall. We selected the top 20 users from a universe of about 100 and conducted 6 complete interviews. Our respondents included an emergency planner, an emergency management director, two transportation specialists, a safety and occupational health specialist, and a reference librarian for an emergency medical service.

The results of the survey included:

* They accessed HMIX on average between 10 and 40 times each month and typically accessed no more than 5 different topics (out of 26 available).

* The users generally accessed Topic 26 to browse, whereas they were more likely to access other HMIX topics seeking specific information.

* Users generally are seeking information they can incorporate into their day-to-day operations. They have very specific needs, ranging from dates for available training to changes in federal hazardous materials regulations.

* Users report sharing information they obtain with a broad range of their colleagues: other local planners and emergency services personnel.

* Users generally felt that HMIX was easier to use than other computer bulletin board systems they typically used but did not feel that Topic 26 was any easier to use than other HMIX topics.

* Most users felt that information on HMIX and in Topic 26 was more up-to-date than other sources of technical information they typically used.

* Most users heard about HMIX by word of mouth, from professional colleagues.

When we asked users to tell us about design features in HMIX they liked their comments included:

* HMIX tells you when you first get access which topics have been updated.

* HMIX has an expert command system.

When we asked users to tell us about HMIX design changes they recommend, their comments included:

* Reduce the amount of time it takes the user to get through the initial screens to start accessing the topics.

* Improve the user's ability to navigate through the system without having to continually go back to the main menu screen.

* Remove the overlap or redundancy among sub-categories.

* Reduce the complexity of uploading and downloading files, which creates problems for beginners.

* Make the expert command codes easier to remember.

CONCLUSIONS/RECOMMENDATIONS

We are receiving positive feedback from people at UETC, DOT, and DOE. The toughest task of the computer information network is getting local government network members to use the system. Our main approach to encourage usage was to design a user friendly system. We designed a system with simple features including:

* Easily viewable screens

* Easily viewable information included on more than one screen

* Easily exchangeable messages and information

* Simple instructions for using HMIX

* Simple evaluation procedures

The survey results suggest that the users of a technical BBS such as HMIX have very different needs from more socially-oriented BBSs. They are willing to browse for specific technical information but would strongly prefer organizational and navigation schemes which allow them to access a system, quickly scan for information, and exit. These preferences suggest recommendations for visual cues for users of highly technical BBSs:

* to quickly identify categories of information in the often long lists of public access messages, for example, subject matter cues for categories such as training, response, safety and accident prevention, and enforcement.

* to retain (even in very reduced size) as a visual reminder to the user which menu area they are viewing.

* to design "visual cues" in a way which can signal similarities or differences in main menu or submenu topics by obvious cues such as color, exterior, or similarity of iconic representation.

ACKNOWLEDGEMENT

The preparation of this paper was funded in part by the U.S. Department of Energy under Cooperative Agreement No. DE-SC06-90RL11860.